

December 4, 2020

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street, N.E.
Washington, D.C. 20554

**Re: Space Exploration Holdings, LLC, Application for Modification of
Authorization for the SpaceX NGSO Satellite System
File No. SAT-MOD-20200417-00037**

Dear Ms. Dortch:

Kepler Communications Inc. (“Kepler”) responds to the letter filed by Space Exploration Holdings, LLC (“SpaceX”) on November 17, 2020 in connection with the above-referenced application.¹ SpaceX is currently seeking authorization to lower the remaining 2,824 satellites in its non-geostationary satellite orbit (“NGSO”) constellation to between 540-570 km—including 520 satellites into 10 polar orbital planes at 560 km—a modification that will result in overlap with Kepler’s previously-authorized Ku-band NGSO system currently operating in polar orbits at 575 km.² In its letter, SpaceX offers to restrict the orbital variance of its constellation to not overlap with the system of one other NGSO operator, Kuiper Systems LLC (“Amazon”), when Amazon commences future satellite operations in its lowest orbital shell. Based on that commitment, SpaceX requests grant of its pending Third Modification, or in the alternative, requests a partial

¹ Letter from David Goldman, Director of Space Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037 (Nov. 17, 2020) (“SpaceX Letter”).

² See Space Exploration Holdings, LLC, Application for Modification of Authorization for the SpaceX NGSO Satellite System, IBFS File No. SAT-MOD-20200417-00037 (filed Apr. 17, 2020) (“Third Modification”); *see also* Kepler Communications Inc., Petition for Declaratory Ruling to Grant Access to the U.S. Market for Kepler’s NGSO FSS System, IBFS File No. SAT-PDR-20161115-00114 (Nov. 19, 2018) (“Kepler Grant”).

grant authorizing the company to begin deployment of its 520 satellite 560 km polar orbit shell prior to a full determination on the Third Modification.³

The Commission should deny SpaceX's request for a partial grant, given the significant concerns that have been raised by Kepler and several other commenters which are not addressed by SpaceX's proposed commitment. SpaceX's letter does not address, let alone resolve, numerous coordination and orbital debris mitigation concerns raised in the comments to its proposed modification. Similarly, SpaceX's offer to protect incumbent authorized systems in its desired modified orbital position is limited to only Amazon, ignoring other licensed—and operational—systems, such as Kepler. SpaceX has repeatedly ignored or dismissed Kepler's objections with misleading and false assessments.⁴ Thus, Kepler urges the Commission to deny SpaceX's request until SpaceX provides meaningful proof that its system will not obstruct nor harmfully interfere with currently authorized systems.

THE SPACEX LETTER ONLY ADDRESSES THE CONCERNS OF A SINGLE OPERATOR WHOSE SATELLITES ARE NOT CURRENTLY IN ORBIT

SpaceX requests that the Commission grant its Third Modification based on its acquiescence to Amazon's proposal that it limit the orbital variance of its constellation to not overlap with the lowest orbital shell of the Kuiper system, and therefore maintain its operations below 580 km.⁵ If accepted, this concession would only benefit a single operator which has yet to launch any satellites. Critically, this proposed solution does nothing to address the conjunction and interference issues with Kepler's satellites, some of which are *already deployed and operating* in the orbital region where SpaceX requests expedited access.

³ SpaceX Letter at 3.

⁴ See, e.g., Kepler Communications Inc., *Reply Comments of Kepler Communications Inc.*, IBFS File No. SAT-MOD-20200417-00037 (Aug. 7, 2020) ("Kepler Reply Comments").

⁵ See SpaceX Letter at 1.

The SpaceX Letter requests that the Commission grant SpaceX partial authorization to deploy 520 satellites into a 560 km polar orbit.⁶ SpaceX has previously stated that “[a]pogee and perigee will be maintained to within 30 km.”⁷ Given its lack of coordination agreement with Kepler, this new proposed orbit is exceptionally problematic: Kepler’s constellation is authorized and operating in a 575 km near-polar orbit.⁸

Despite SpaceX’s recognition that operator-to-operator coordination is the “gold standard for resolving issues between NGSO systems,” SpaceX’s commitment is notably silent with respect to all other NGSO operators except for Amazon.⁹ Kepler has repeatedly stated its willingness to coordinate with SpaceX to achieve a mutually satisfactory agreement, however SpaceX’s ever-changing constellation has made it difficult to conclude such an agreement.¹⁰ In the absence of any assurance that Kepler will be able to continue to safely operate its system, as authorized in the same processing round as SpaceX’s initial authorization, Kepler respectfully requests that the Commission deny SpaceX’s request for full or partial grant of its Third Modification request until all of the pending interference and orbital debris mitigation issues are resolved.

SPACEX HAS FAILED TO RESOLVE THE ISSUES RAISED IN THE COMMENTS TO ITS THIRD MODIFICATION REQUEST

SpaceX’s Letter does not resolve the outstanding concerns of commenters regarding the real risk of its constellation to endanger other operations on orbit—namely, SpaceX has yet to demonstrate that its proposed modification is consistent with public interest as it relates to the mitigation of orbital debris and harmful interference.

⁶ *Id.* at 3.

⁷ Letter from William M. Wiltshire, Counsel to SpaceX, to Jose P. Albuquerque, Chief, International Bureau, FCC, IBFS File No. SAT-LOA-20161115-00118, at 1 (Apr. 20, 2017).

⁸ Kepler Communications Inc., Petition for Declaratory Ruling to Grant Access to the U.S. Market for Kepler’s NGSO FSS System, IBFS File No. SAT-PDR-20161115-00114 (Nov. 19, 2018) (“Kepler Grant”).

⁹ SpaceX Letter at 2.

¹⁰ Petition to Deny of Kepler Communications Inc., IBFS File No. SAT-MOD-20200417-00037, at 1 (Jul. 13, 2020).

The three SpaceX modification dockets are replete with concerns regarding the exceedingly high failure rate of SpaceX's Starlink satellites. As Kepler noted in opposition to SpaceX's second modification application, SpaceX had experienced a number of critical failures right from the launch of its first tranche of satellites.¹¹ SpaceX has since acknowledged that 1.7% of its first 360 satellites have become non-maneuverable—half of which lost maneuverability in the same 500-600 km range in which Kepler is authorized to operate in.¹² Viasat has astutely noted that SpaceX repeatedly committed to “defer further deployment until the problem has been identified and corrected before resuming launch of subsequent spacecraft” and other corrective measures in the event its failure rate exceeded 1 percent,¹³ but instead SpaceX has launched approximately 600 additional satellites without any evidence of curative action.

This failure to address maneuverability malfunctions and other orbital debris risks is of serious concern to Kepler, especially given the direct overlap between SpaceX's proposed orbit and Kepler's operational satellites. SpaceX's previous commitment that it will “take full responsibility for physically avoiding any other satellites,” is empty in light of the unacceptably high rate of on-orbit failures and the company's refusal to respond to concerns of other NGSO operators who share operational orbits with them.¹⁴ SpaceX's ability to assure collision avoidance is dependent on its spacecrafts' continuing ability to complete maneuverability and communications functions. Furthermore, as SES Americom and O3b Limited have reminded the Commission, SpaceX has yet to even provide sufficient details regarding its collision avoidance system to support the underlying dependability claims the company asserts.¹⁵

¹¹ Consolidated Petition of Kepler Communications Inc., IBFS File No. SAT-MOD-20190830-00087, 7-8 (filed Oct. 15, 2019) (observing that “SpaceX reported that 3 of its 60 satellites had experienced a total loss of communication (5%), and that 10 more had not yet completed their expected orbit raise procedures.”).

¹² Letter from William M. Wiltshire, Counsel to SpaceX, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037, at 4-5 (May 15, 2019).

¹³ See Letter from Amy R. Mehlman, Vice President, Viasat, Inc., to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037, at 1-3 (Nov. 19, 2020) (“Viasat Letter”).

¹⁴ See SpaceX Letter at 2.

¹⁵ See Letter from Karis A. Hastings, Counsel for SES, to Marlene H. Dortch, Secretary, FCC, File No. SAT-MOD-20200417-00037 (Nov. 23, 2020) (“SES Letter”).

In addition to physical orbital safety concerns, SpaceX has also downplayed and failed to address other NGSO operators' concerns of an increased risk of harmful interference caused by the further modified system.¹⁶ In its opposition to the Third Modification, Kepler demonstrated that the modification would increase the magnitude of interference into Kepler's system.¹⁷ Rather than resolve these concerns, SpaceX has requested that the Commission authorize its satellites on a non-harmful interference basis.¹⁸ This would enable SpaceX to delay and obfuscate future interference disputes with claims that any interference experienced actually originated from its previously-authorized satellites, and not those authorized to operate on a non-harmful interference basis. Grant of such a request would introduce unnecessary uncertainty into the operating environment of duly authorized NGSO systems that are also deploying constellations and should be denied. SpaceX should be required to coordinate and demonstrate an ability to operate alongside previously-authorized systems in the operational orbit it seeks authorization for *prior* to commencing any operations.

SPACEX'S CLAIM OF A UNIQUE LAUNCH OPPORTUNITY DOES NOT WARRANT AN EXPEDITED GRANT OF AUTHORIZATION

SpaceX has not demonstrated a sufficient public interest basis for which expedited authorization—or piecemeal grant of its modification—would be justified. SpaceX suggests that an expedited authorization is justified due to the availability of a polar launch opportunity in December 2020. As aptly pointed out by Viasat and Amazon, this is by no means a unique opportunity for SpaceX.¹⁹

The upcoming launch opportunity described by SpaceX is a rideshare mission, which includes eight new Kepler satellites. Not only does SpaceX propose to operate in an orbit directly

¹⁶ See Viasat Letter at 6; *see also* SES Letter at 1-2.

¹⁷ See *generally* Kepler Reply Comments.

¹⁸ See SpaceX Letter at 2.

¹⁹ See Viasat Letter at 4; Letter from Mariah Dodson Shuman, Corporate Counsel, Kuiper Systems LLC, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037, at 2-3 (Nov. 24, 2020).

overlapping Kepler's, but it plans to inject its first tranche of polar satellites into the 560 km orbit from the same launch vehicle. Given SpaceX's plans to deploy these satellites into overlapping orbits with Kepler, the potential that even a subset of these satellites could fail and disrupt the deployment of Kepler's constellation is an unjustifiable risk Kepler should not be exposed to given that this modification has not been fully validated by the Commission.

Unlike every other NGSO operator, who are all at the mercy of a launch operator's schedule and availability, SpaceX is uniquely capable of launching its own payloads to its desired orbit whenever the appropriate launch window becomes available. This launch opportunity is demonstrably not particularly unique, as this specific launch has already been delayed to January 2021—and occurs multiple times per year.²⁰

SpaceX also claims that public interest would be served by this launch, noting that it would allow the provision of broadband services to communities in Alaska.²¹ SpaceX has failed to explain how this single launch would help achieve its service goals in remote regions. To complete its polar planes and be able to provide continuous service to polar regions SpaceX would need to complete at least 9 polar launches. SpaceX does not say how soon after the first launch it would fill in the remainder of its polar orbital shells in order to “bridge the digital divide.” SpaceX's broadband service is also still at a beta testing stage, and not currently capable of providing stable commercial services.²² SpaceX should not be granted a premature authorization based on vague claims of commercial expediency.

²⁰ SpaceX's sole Falcon 9 launch to sun-synchronous orbit planned for December 2020 was the Transporter 1 mission (aboard which 8 Kepler satellites will also be launched). That mission has been postponed to January 2021, as of November 2020. *See* SpaceFlight Now, Launch Schedule, Pole Star Publications Ltd (last accessed: November 26, 2020) <https://spaceflightnow.com/launch-schedule/>.

²¹ *See* SpaceX Letter at 2.

²² *See* Space Exploration Holdings, LLC, Starlink Better Than Nothing Beta Program (last visited Nov. 26, 2020) www.starlink.com.

CONCLUSION

SpaceX has not satisfied the conjunction concerns for operational systems currently in orbit. SpaceX asserts that its constellation will be capable of reliably avoiding any other satellites but has yet to provide meaningful proof of this claim. Harmful interference issues still remain unaddressed by SpaceX; while proposing to operate temporarily on a non-harmful-interference basis, this would only lead to even further obfuscation and dilution of coordination discussions SpaceX has yet to complete. SpaceX has also not demonstrated a sufficient public interest basis for its request. Most critically, despite launching its satellites on the same launch vehicle and into the same orbit as Kepler, SpaceX has not provided any consideration for Kepler's operational system. For the foregoing reasons, Kepler urges the Commission to deny SpaceX's request and proceed with its critical evaluation of SpaceX's Third Modification.

Respectfully submitted,

/s/ Nickolas G. Spina

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